Claims

1-36 Canceled

37. (New) An electrohydraulic brake system for a motor vehicle which can be operated in a 'brake-by-wire' mode of operation, comprising:

a master cylinder (1) connectable to wheel brake cylinders;

a first piston (2) coupled to a brake pedal (3),

a second piston (4) for actuating the master cylinder (1),

a third piston (5) which can be operated by the first piston (2), with at least one brake pedal characteristics simulation device (6, 7) for exerting a simulator force being provided between the first (2) and the third piston (5) and imparting a comfortable pedal feel to an operator in a by-wire mode of operation, wherein the first piston, the second piston, the third piston and the travel simulator device are arranged in a housing (8),

a hydraulic pressure source (9); and

a valve device (10) operable by the third piston (5) for reducing a pressure of the pressure source (9) to a value used for application of the second piston (4), wherein the second (4) and the third piston (5) are isolated from each other by a space (11) so that the third piston (5) is acted upon by the pressure that acts on the second piston (4) in a direction opposite to a direction of application of the second piston (4); and

a valve member (13) of the valve device has both end surfaces exposed to an effect of the pressure that prevails in the space (11).

38. (New) The brake system according to claim 37, wherein an end surface of the valve member (13) is exposed to the effect of the pressure prevailing in the space

(11) by way of a hydraulic connection (12) provided in the housing (8).

39. (New) The brake system according to claim 37, wherein two end surfaces of the valve member (13) communicate with each other through a longitudinal bore in the valve member (13).

40. (New) The brake system according to claim 37, wherein moving directions of the valve member (13) and the third piston (5) upon actuation of the valve device (10) by the third piston (5) are identical.

41. (New) The brake system according to claim 37, wherein the valve member (13) can be actuated directly by the third piston (5).

42. (New) The brake system according to claim 41, wherein the third piston (5) includes a radial projection (14) which cooperates in a force-transmitting fashion with the end surface of the valve member (13) facing the space (11).

43. (New) The brake system according to claim 37, wherein the valve member (13) is operable by a lever or cross bar (31) which cooperates with the third piston (5), is mounted in the housing (8) and arranged preferably vertically to the longitudinal axis of the third piston (5).

44. (New) The brake system according to claim 37, wherein the hydraulic pressure source (9) is formed of a high-pressure accumulator (19) which can be charged by a motor-and-pump assembly (20).

45. (New) The brake system according to claim 44, wherein a second valve device (15, 16) that is electrically operable by means of an electronic control unit is used to influence the pressure that is to be introduced into the space (11) and is integrated in the housing (8).

46. (New) The brake system according to claim 44, wherein a pressure sensor (39) is provided to monitor a charging condition of the high-pressure accumulator (19), whose output signal is sent to the electronic control unit and which is integrated in the housing (8) or form-lockingly connected to the housing.

47. (New) The brake system according to claim 44, wherein a pressure sensor (18) is provided to sense the pressure that prevails in the space (18), whose output signal is sent to the electronic control unit and which is integrated in the housing (8) or form-lockingly connected to the housing.

48. (New) The brake system according to claim 44, wherein the high-pressure accumulator (19) is arranged directly at the housing (8), and a hydraulic connection (23) between the pressure side of a pump (27) of the motor-and-pump assembly (20) and the high-pressure accumulator (19) is formed by at least one bore provided in the housing (8).

49. (New) The brake system according to claim 48, wherein a non-return valve (24) opening towards the high-pressure accumulator (19) is inserted into the hydraulic connection (23).

50. (New) The brake system according to claim 37, wherein an electronic control or regulation unit (28) of an anti-lock system (ABS) is connected to the master brake cylinder (1).

51. (New) The brake system according to claim 50, wherein the electrohydraulic control or regulation unit (28) operates according to the return delivery principle and includes a device (30) for the return delivery of excessive pressure fluid volume into the master brake cylinder (1).

52. (New) The brake system according to claim 50, wherein the motor-and-pump

assembly (20) is integrated into the electrohydraulic control or regulation unit (28).

53. (New) The brake system according to claim 52, wherein pressure fluid under atmospheric pressure is supplied to the pump (27) through a first hydraulic connection (50) arranged between the housing (8) and the control or regulation unit (28), and the pressure fluid discharged under high pressure from the pump (27) is conducted through a second hydraulic connection (51) being arranged between the control or regulation unit (28) and the housing (8) to a portion (52) of the hydraulic connection (23) that extends within the housing (8) and leads to the high-pressure accumulator (19).

54. (New) The brake system according to claim 53, wherein a non-return valve opening to the high-pressure accumulator (19) is inserted within the portion (52).

55. (New) The brake system according to claim 54, wherein the depth of the profile of the tire is taken into consideration in the assessment of the frequency curve in the driving operation.

56. (New) The brake system according to claim 54, inserted within the portion (52) is an electrically controllable valve (25), preferably a two-way/two-position directional control valve, which fulfils the function of a non-return valve opening towards the high-pressure accumulator (19) in a first switch position and opens the hydraulic connection (51) in a second switch position.

57. (New) The brake system according to claim 52, wherein the device (30) for the return delivery of excessive pressure fluid volume can be driven by the pressure generated by the motor-and-pump assembly (9).

58. (New) The brake system according to claim 52, wherein the device (30) for the return delivery of excessive pressure fluid volume can be driven both by the

pressure generated by the motor-and-pump assembly (20) and by the pressure prevailing in the high-pressure accumulator (19).

59. (New) The brake system according to claim 58, wherein the device (30) is provided by at least two low-pressure accumulators (30a,b; 40a,b) which alternately take up prevailing pressure fluid volume or displace the prevailing pressure fluid volume under the effect of the driving pressure in the sense of a return delivery.

60. (New) (New) The brake system according to claim 58, wherein the motor-and-pump assembly (20) or the high-pressure accumulator (19) in conjunction with the electrically controllable valve (25) cooperates with a valve device (29) which alternately provides the driving pressure or the atmospheric pressure for the low-pressure accumulators (30a,b; 40a,b).

61. (New) The brake system according to claim 60, wherein the valve device (29) is integrated into the electrohydraulic control or regulation unit (28).

62. (New) The brake system according to claim 37, wherein the brake pedal characteristics simulation device has at least one elastic element (6, 7) which exerts a 'spring force' component of the simulator force that depends on the relative travel between the first (2) and the third piston (5).

63. (New) The brake system according to claim 62, wherein the brake pedal characteristics simulation device has at least one damping device which exerts a damping force component of the simulator force that depends on a relative speed between the first (2) and the third piston (5).

64. (New) The brake system according to claim 62, wherein the brake pedal characteristics simulation device (6, 7) comprises at least one of the components steel spring, elastomeric body, and frictional connection, exerting the simulator

force.

65. (New) The brake system according to claim 62, wherein the brake pedal characteristics simulation device (6, 7) can be blocked in such a manner that it prevents a movement of the first piston (2) relative to the third piston (5) in the actuating direction which exceeds the existing piston positions.

66. (New) The brake system according to claim 65, wherein the brake pedal characteristics simulation device (6, 7) is blocked in dependence on the relative travel of the third piston (5) with respect to the housing (8).

67. (New) The brake system according to claim 66, wherein the brake pedal characteristics simulation device cooperates with a hydraulic chamber (21) that is limited by the first piston (2) in the third piston (5) and is in connection to an unpressurized pressure fluid supply reservoir (22) through another hydraulic connection (50) and which can be closed by a relative movement of the third piston (5) relative to the housing (8)

68. (New) The brake system according to claim 67, wherein the brake pedal characteristics simulation device cooperates with a hydraulic chamber (42, 43, 44, 45) that is limited by the first piston (2) in the third piston (5) and is in connection to the unpressurized pressure fluid supply reservoir (22) and which can be closed by a relative movement of the third piston (5) relative to the housing (8).

69. (New) The brake system according to claim 62, wherein wherein the brake pedal characteristics simulation device (6, 7) can be blocked in so that it prevents in the a movement of the first piston (2) relative to the second piston (4) in the actuating direction which exceeds the existing piston positions.

70. (New) The brake system according to claim 62, wherein some damping of the

brake pedal characteristics simulation device (6, 7) is achieved by a corresponding dimensioning of a hydraulic connection (50) between the hydraulic chamber (42, 43, 44, 45) and the unpressurized pressure fluid supply reservoir (22).

71. (New) The brake system according to claim 70, wherein the damping of the brake pedal characteristics simulation device (6, 7) is achieved by a hydraulic damping device inserted into the hydraulic connection (50).

72. (New) The brake system according to claim 71, wherein the damping device comprises hydraulic orifices and includes a damping characteristic which depends on the direction of flow.

73. (New) The brake system according to claim 62, wherein the components exerting the simulator force are arranged in each case either outside ('dry') or inside ('wet') the hydraulic chamber (21)